



STATE OF MAINE  
DEPARTMENT OF ENVIRONMENTAL PROTECTION

ANGUS S. KING, JR.  
GOVERNOR

EDWARD O. SULLIVAN  
COMMISSIONER

June 23, 1999

Mr. Emil Klawitter  
Code 1823 EK  
Department of the Navy, Northern Division  
Naval Facilities Engineering Command  
10 Industrial Highway, Mail Stop 82  
Lester, PA 19113-2090

Re: Monitoring Event 13 – November 1998, Sites 1 and 3 and Eastern Plume,  
Naval Air Station, Brunswick, Maine”

Dear Mr. Klawitter:

The Department of Environmental Protection (DEP or Department) has reviewed the report entitled Monitoring Event 13-November 1998, Sites 1 and 3 and Eastern Plume, dated March 1999, prepared by EA Engineering, Science and Technology. Based on that review the Department has the following comments and issues.

Any revision or corrections noted for Monitoring Event 13 should be incorporated into the final annual report (1998).

General Comments:

1. Ground-Water Analytical Program, Section 1.3.4, page 8, last statement:

“...the precision and accuracy objectives and reporting requirements identified in the Draft LTMP were met.”

Due to a number of false positives important information is lost and we must wait for the next monitoring event to garner this information. The causes of these false positives should be determined and the necessary steps taken to prevent them. (See comment 18 below.)

Specific Comments:

2. Introduction, Section 1.1, page 1, 2<sup>nd</sup> para, last sentence:

Please replace “establishes” with “*proposed revisions for*”.

3. Introduction, Section 1.1, page 1, 2<sup>nd</sup> para, last sentence:

After “...to provide additional hydraulic control...” insert “*and contaminant mass removal*”.

AUGUSTA  
17 STATE HOUSE STATION  
AUGUSTA, MAINE 04333-0017  
(207) 287-7688  
RAY BLDG., HOSPITAL ST.

BANGOR  
106 HOGAN ROAD  
BANGOR, MAINE 04401  
(207) 941-4570 FAX: (207) 941-4584

PORTLAND  
312 CANCO ROAD  
PORTLAND, MAINE 04103  
(207) 822-6300 FAX: (207) 822-6303

PRESQUE ISLE  
1235 CENTRAL DRIVE, SKYWAY PARK  
PRESQUE ISLE, MAINE 04769-2094  
(207) 764-0477 FAX: (207) 764-1507

4. Introduction, Section 1.1, page 2, bottom para:

Please include direct-push letter report (EA 1999) as an appendice to the 1998 Annual Report.

5. Field Activities, Section 1.2.1, page 3, 3<sup>rd</sup> para:

DEP is glad to see that information on antecedent precipitation is now included. Mention of where the precipitation data were collected would be helpful to the reader.

6. Results, Section 1.2.2, page 4, 1<sup>st</sup> para:

Because the maps of Figures 5 – 11 depict groundwater flowing in almost every compass direction, a brief explanation is required. DEP suggests the following be added: *"Primarily as a result of intersecting stream valleys and variable pumping from scattered remedial extraction wells, the direction of ground-water flow varies greatly within the mapped area."*

7. Eastern Plume, Section 1.3.2.2, page 7, 1<sup>st</sup> bullet:

"All but 2 of these wells (MW-105A and MW-224) are screened within the unconfined upper stratified sand/silt transition unit; all of the wells are located along the western or southern boundaries of the Eastern Plume."

MW-224 appears to be screened in the shallow system according to its well log. The log of MW-105A indicates alternating clayey and sandy layers, and thus may be within the transition unit. It appears to DEP that these wells are not exceptions, thereby providing an explanation for high dissolved oxygen content in their water. Please correct.

8. Ground-Water Extraction and Treatment System, Section 1.3.3.4, page 7, 2<sup>nd</sup> bullet:

It is noted that extraction well EW-3 may remain off-line indefinitely, and that it has remained shutdown through March 1999. Historically, this well pumped about 1 MGD, and was a significant contributor to the total Eastern Plume remedial pumping. While EW-2A undoubtedly has filled the void to a degree, it remains to be determined if EW-3 should be rehabilitated. These two wells are about 800 feet apart. This needs to be resolved as soon as possible.

9. Sites 1 and 3, Section 1.3.5.1, page 8:

Table 11 is referenced as providing the analytical results for groundwater samples. An examination of Table 11 shows that for MW-217B exceedences above the MCL or MEG occurred for benzene, vinyl chloride, and 1,4-dichlorobenzene. A bullet should be added to reflect this, as is done for the Eastern Plume in the following section.

It seems somewhat mysterious that vinyl chloride has remained near the 100 µg/L concentrations at MW-217B, while there are no other detections of vinyl chloride in the landfill area. MW-217B is screened at the water table. Figures 5 and 6 indicate a steep southeastward hydraulic gradient near this well. DEP notes that SEEP 4 sample contains both vinyl chloride (11 µg/L) and 1,2-DCE (30 µg/L). The shallow water table contours are likely not drawn properly in this area. What is the Navy's explanation as to where the vinyl chloride is migrating?

10. Eastern Plume, Section 1.3.5.2, page 8, 1<sup>st</sup> bullet:

"These stations are located south of MW-311 near newly installed sentinel wells MW-333 and MW-334."

On page 9 wells MW-333 and MW-334 are called perimeter wells. This difference must be resolved per the proposed LTMP definitions. Because MW-333 has a detection of 1,1,DCA (1 µg/L), which is likely the edge of the plume, this well is better called a perimeter well, not a sentinel well.

11. Interpreted Shallow Ground-Water Potentiometric Surface Contour Map, Figures 5 and 6:

a.) The Department questions the drawing of contour lines between the west end of the Weapons Compound and Mere Brook between wells MW-203 and MW-202A. It is difficult to imagine groundwater flow paralleling the stream, as the flow arrow depicts. Are there elevations on Mere Brook in this area to guide contouring? More typically, the contours would "wrap" upstream, and imply groundwater flow toward the stream. Such an interpretation would then explain the movement of vinyl chloride from MW-217B to SEEP 4.

b.) Also, it appears that EW-02 has virtually no impact on the shallow groundwater contours, although EW-02 was pumping at a higher rate than EW-03 (which apparently does create a significant drawdown cone). Please explain this in light of the large head difference between the pumping water elevation and the elevation in EP-112, located 100 feet upgradient.

c.) Because the extraction wells (except EW-02A) are screened in the upper and lower sands, the measured pumping levels in these wells is a combination of the hydraulic effects of both aquifers, and will not give a valid head for either shallow or deep contouring. Thus, the drawdowns shown are rough estimates and should be noted as such.

d.) Interpretation of shallow and deep potentiometric contouring around EW-03 suggests to DEP that this well is mostly impacting shallow groundwater heads, and has negligible effect on the deeper aquifer. This should be addressed during the Navy's evaluation of the efficiency of the extraction system operation.

e.) Please change EW-3 in the Site 1 & 3 landfill to read *EW-6*.

12. Interpreted Deep Ground-Water Potentiometric Surface Contour Map, Figures 8 and 10:

(The following comment is a repeat of DEP's comment 14 during the Event 12 review.)

In this report as well as earlier reports, the deep potentiometric contour maps indicate a bulb-shaped low head area that parallels Mere Brook and runs to the Site 1 & 3 landfill area. The July 2, 1998 contours, in particular, infer discharge of groundwater within the 21-foot bulb. This feature appears strange, but has not been addressed by past comments. Two explanations could be advanced: (1) the landfill cap and head lowering within the slurry wall might be casting a downgradient shadow, or (2) underground features exist under the Weapons Compound that might cause a drain effect on groundwater.

However, the Department offers a more supportable explanation. We observe that water elevations in two monitoring wells (MW-218 and MW-220) are largely responsible for the 21-foot contour shown with a pronounced western protrusion. The screens in these wells are between 30 and 45 feet below land surface, and are about 10 feet deeper than the screens in their paired shallower wells (MW-203 and MW-210B, respectively). But, the drilling logs indicate that all four screens are above the first

confining stratum. Therefore, while a significant downward gradient is evident at these well pairs, all four wells monitor the shallow groundwater zone.

The Department recommends deleting MW-218 and MW-220 from the deep potentiometric maps, and redrawing the 21-foot contour so it is centered on Mere Brook and does not encompass the Weapons Compound.

13. Interpreted Deep Ground-Water Potentiometric Surface Contour Map, Figure 10:

The closeness of the 18-foot and 21-foot contours between MW-207A and MW-105A does not seem realistic. No data exist to justify spacing less than ¼ inch. The 18-foot contour should be moved southward to Mere Brook. It is noted that this spacing is not a problem on Figure 8 because the 18-foot contour was terminated just east of EW-02. Was this intentional?

14. Interpreted Shallow Ground-Water Total VOC Contour Map, Figure 13:

The extraction wells should be shown on this figure.

SEEP 4 between the landfill and Mere Brook should be added as a location where emerging groundwater exceeds the MEGs/MCLs (vinyl chloride). A discussion should be held at the next technical meeting as to whether a new monitoring well is needed to test if the vinyl chloride is moving downgradient from the area of MW-217B. If this were the case, the VOC distribution would be significantly greater than shown on Figure 13.

15. Interpreted Deep Ground-Water Total VOC Contour Map, Figure 14:

The stipled area needs to be extended southward at the MW-311 contaminant bulb so that it fills and overextends the 100 µg/L contour of total VOCs. The Department notes that the 100 contour is now extended past Mere Brook in one locality. DEP believes that this may actually occur, and commend the Navy for its foresight. New data will be needed to substantiate if the plume crosses beneath the stream, and over what stream reach.

16. Summary of Analytical Results for Ground-Water Samples, Table 12:

On the second page of the table, why does a "B" appear after trichloroethene for well MW-319? Apparently the value of 18 µg/L was added to get the total of 67 µg/L, which was used on Figure 14.

The same situation appears for MW-NASB-212. Please correct as necessary.

17. Analytical Results for Direct-Push Sampling, Tables 13 & 20, and Appendix B.4.1:

The Department notes that the results of 270D µg/L for 1,1-dichloroethene and 480D µg/L for trichloroethene at DP-EP-05 (22 to 26 ft bgs) are qualified as biased low by the QA/QC review. This needs to be noted in the text.

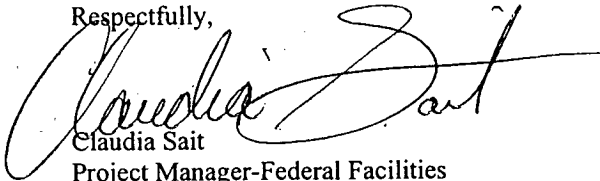
18. Summary of Analytical Data Quality Review, Table 20:

A significant number of results were determined to be false-positives. This situation is quite disturbing because many TCE values are involved. As this is a prime contaminant of concern in the Eastern Plume, and the Navy and its consultant must take steps to reduce the impact of false-positives. Resampling will be necessary if this continues to occur.

Page 5 of 5

Thank you for the opportunity to review this report. If you have any questions or comments please call me at (207) 287-7713.

Respectfully,

A handwritten signature in black ink, appearing to read 'Claudia Sait', with a long horizontal flourish extending to the right.

Claudia Sait

Project Manager-Federal Facilities  
Bureau of Remediation & Waste Management

Cf: File

Larry Dearborn-DEP

~~Anthony Williams-BNAS~~

Michael Barry-EPA

Carolyn LePage-LePage Environmental

Peter Nimmer-EA

Susan Weddle-BACSE